TWO NEW GENERA OF MARINE ISOPOD CRUSTACEANS (CIROLANIDAE) FROM MADANG, PAPUA NEW GUINEA

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Aatolana gen.nov. is characterized by lobate pleopod peduncles, medially indented cephalon anterior margin, and posteriorly acute epimera on pleonite 3. *Aatolana rapax* sp.nov., the type species, is described from specimens trapped at depths from 150-450m off the outer reef slope at Madang. *Aatolana schiodtei* comb.nov. is transferred from the genus *Cirolana*. *Plakolana* gen.nov. is characterised by flattened posterior pereopods provided with long setae and spines, a medially indented cephalon anterior margin, elongate frontal lamina, quadrate pleopod 1 peduncle and the unique shape of the epimera of pleonite 3. *Plakolana accola* sp.nov., the type species, is described from trapped specimens off the outer reef slope at Madang, at depths from 300 to 450m. *Plakolana nagada* sp.nov. occurs within the barrier reef in shallow (16-22m) silty or sandy bottoms. *Plakolana* sp. and *P. binyana* comb.nov. are transferred from *Cirolana*. Both genera are known only from the Southwest Pacific. ☐*Isopoda, Cirolanidae, new genera, new species, Aatolana, Plakolana, southwest Pacific, taxonomy.*

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Published reports devoted to the marine isopod fauna of New Guinea are few (see Bruce, 1982, Jones et al., 1983) although a number of records have recently been published as part of longer reports (e.g. Bruce, 1986a,b; Bruce & Harrison-Nelson, 1988; Williams & Williams, 1992). The nearby region of tropical and subtropical Queensland has received more attention from isopod taxonomists, and there the family Cirolanidae is represented by 52 species in 12 genera (although numerous species still remain to be described).

In 1989, I spent three weeks at the Christensen Research Institute at Jais Aben, Madang surveying the isopod fauna of the reefs and, to a lesser extent, near-reef sediments, from the intertidal to a depth of about 30m. Cirolanids were sampled at greater depths by the use of baited traps. The area proved to have a rich and diverse isopod fauna with well in excess of 100 species. With more thorough sampling of particulate sedimentary habitats this total should rise even further.

The family Cirolanidae is represented in the Madang collection by about 27 species in 11 genera, indicating a very high diversity when compared to figures available for single localities elsewhere. For example, Heron Island, a well collected location at the southern end of the Great Barrier Reef has 16 species in 7 genera (Bruce, 1986a). The entire Caribbean region has a total 22 free-living species (Kensley & Schotte, 1989), while Aldabra Island, in the Western Indian Ocean, when surveyed by Kensley (1988), yielded only 3 species.

MATERIAL AND METHODS

Specimens were collected using methods described in Bruce (1986). Appendages were dissected from the right side of the specimen unless stated otherwise in the figure captions. All species described here were collected by setting baited traps overnight. The trap design is a 'minnow trap' made of storm drain piping fitted with end caps to which cut off funnels had been fitted.

Drawings of appendages were made using a compound microscope for *Plakolana* and a dissecting microscope for the larger *Aatolana*.

Pereopod orientation is identified as anterior (= superior) and posterior (= inferior); the margin to which the dactylus folds is regarded as posterior in both pereopods 1-3 and 4-7, even though the orientation of the posterior limbs is reversed; the lateral surface is the outward facing surface of the pereopod, and mesial is inward facing. Anterior (An) and posterior (Po) are identified on Fig 2.

Specimens have been deposited at the Queensland Museum (QM), Australian Museum (AM) and Museum of Victoria (NMV). Voucher samples have been donated to the San Diego Natural

History Museum. PMS= plumose marginal setae; BL= body length.

TAXONOMY

GENERAL REMARKS

Bruce (1986a: 223) listed a number of cirolanid species as incertae sedis, all but one being retained in *Cirolana*. Since that time only one, *Protognathia bathypelagica* (Schultz, 1977) has been relocated (Wägele & Brandt, 1988). Two of the species described by Bruce (1986a), *Cirolana schiodtei* Miers and *Cirolana* sp., were regarded as not conforming to the concept and diagnosis of *Cirolana*, but establishment of new monotypic genera was regarded as premature. Bruce (1991) later described a species that was obviously very similar to *Cirolana* sp. of Bruce (1986a) with the same set of characters that precluded assignment to *Cirolana*. That species was placed in *Cirolana*, also with the caveat of incerta sedis. The discovery of the species described here now provides a solid foundation to establish new genera for these species. In so doing, the generic concept of *Cirolana* can also be refined. It can now be stated that in *Cirolana* (sensu stricto) the anterior margin of the cephalon is with a rostral point or smoothly rounded (never medially indented); pleonite 3 does not encompass pleonites 4 and 5, though pleonite 3 is often posteriorly produced; pleonite 3 (in all Australian species) is narrowly rounded or acute; pereopods 5-7 are without long setae or long spines, and are robust (i.e. have few short spines, and no flattened articles).

Aatolana gen.nov.

Body without tubercles or dorsal sculpture. Cephalon without rostral point, anterior margin medially indented. Eyes large, about 3 times as long as wide. Pereonite 1 about twice as long as pereonite 2. Pleon with 5 visible segments; pleonite 3 with epimera expanded, posteriorly acute, extending to or beyond pleonite 5. Pleotelson with stout spines and PMS.

Antennule peduncle articles of about equal length; article 2 shortest. Antennal peduncle with articles 1-3 short, 4 and 5 longest. Frontal lamina slightly longer than wide; anterior margin curved, visible in dorsal view, with dorsally deflected apical point. Mandible with spine row and molar process well developed; lacinia mobilis absent; incisors assymetrical, right with 3 prominent cusps, left with middle cusp reduced. Maxillule with stout spines on lateral lobe; 3 robust circumplumose spines on medial lobe. Maxilla with all lobes well developed. Maxilliped palp with lateral and medial margin setose; endite with 2 coupling hooks.

Pereopods 1-3 with anterodistal margins of ischium and carpus not produced; posterior margin without elongate spines. Pereopods 5-7 subsimilar. Pereopod 7 with all articles robust, not flattened or natatory; basis with row of setae on posterior margin and lateral carina. Pereopod dactylus without distinct secondary unguis. Penes present on sternite 7, flattened, rectilinear, about twice as long as wide.

Pleopod 1 exopod lateral margin convex, apex narrow. Pleopods 1-3 with both rami with PMS; pleopods 3 and 4 endopods with reduced PMS; endopod of pleopod 5 without PMS. Peduncles of pleopods 1-5 with lateral margin forming, complex refolded lobe. Pleopod 2 appendix masculina basally attached, elongate, longer than endopod. Pleopod 1-4 exopods with slender accessory lamella at posterior proximolateral angle. Uropods with stout spines; mediodistal angle of peduncle produced.

Female: Maxilliped with lamina vibrans in ovigerous specimens. Brood pouch composed of oostegites arising from coxae 1-5. Pleopods 2-5 with accessory lamellae more prominent than in male.

TYPE SPECIES

Aatolana rapax sp.nov., here designated.

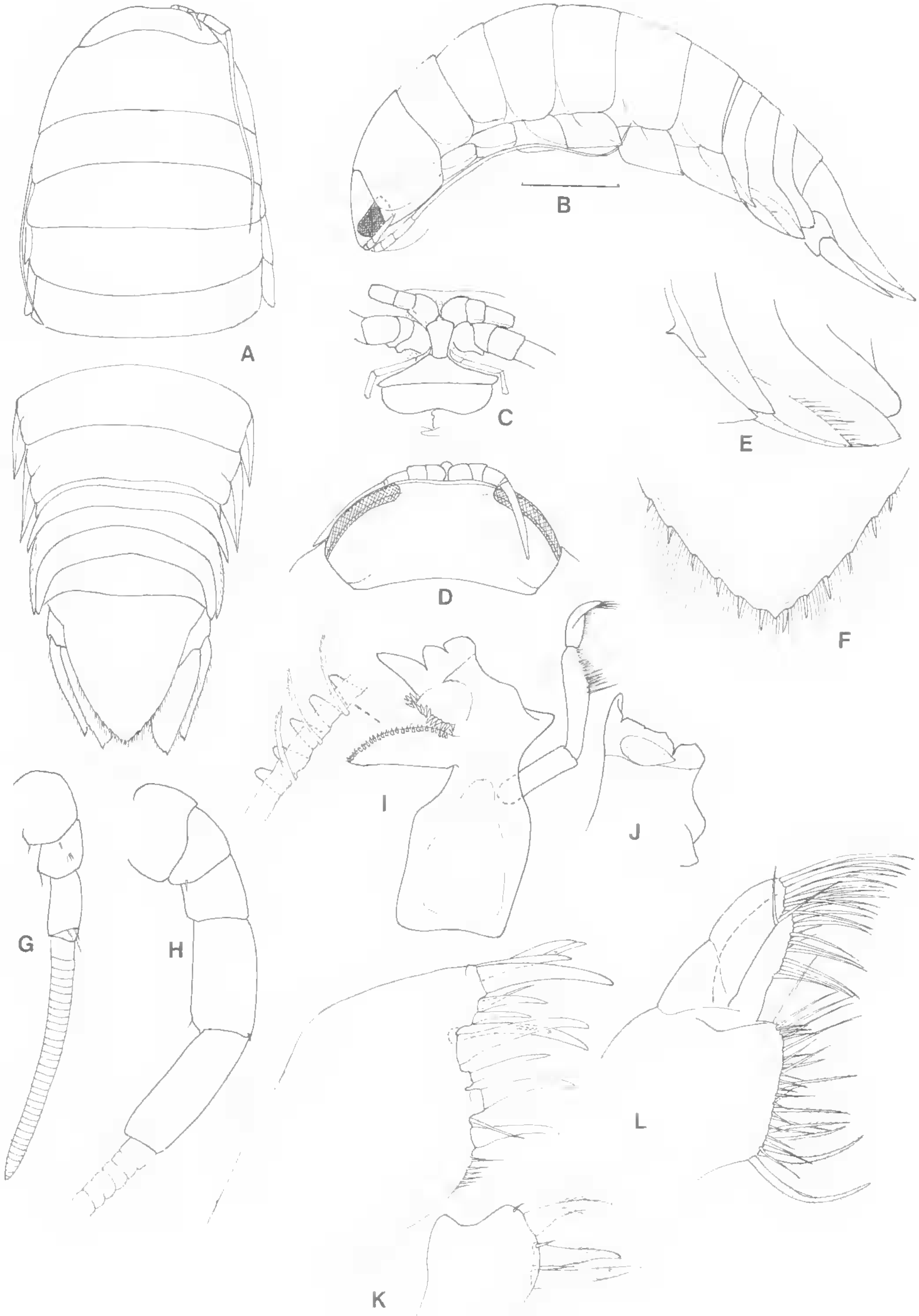
ETYMOLOGY

From the Greek *Aatos* (insatiable, referring to the ability of this species to devour fish carcasses) combined with *-lana*. Gender is feminine.

REMARKS

Characters by which this genus can be identified are the unique apomorphies of the pleopod peduncle lobes and the frontal lamina structure, and also the prominent and posteriorly acute epimera on pleonite 3. Other characters which also identify the genus, though not unique, are the medially indented anterior margin of the cephalon, the shape of pleopod 1 exopod, and the prominent flattened penes. The medially indented anterior margin of the cephalon is a subtle char-

FIG. 1. *Aatolana rapax* sp.nov. A-F holotype, remainder ♂ paratype 32.3mm. A, dorsal view; B, lateral view; C, frons; D, cephalon, dorsal view; E, pleonites, lateral view; F, telson apex; G, antennule; H, antenna peduncle; I, right mandible; J, left mandible incisor; K, maxillule; L, maxilla. Scale represents 4.0mm.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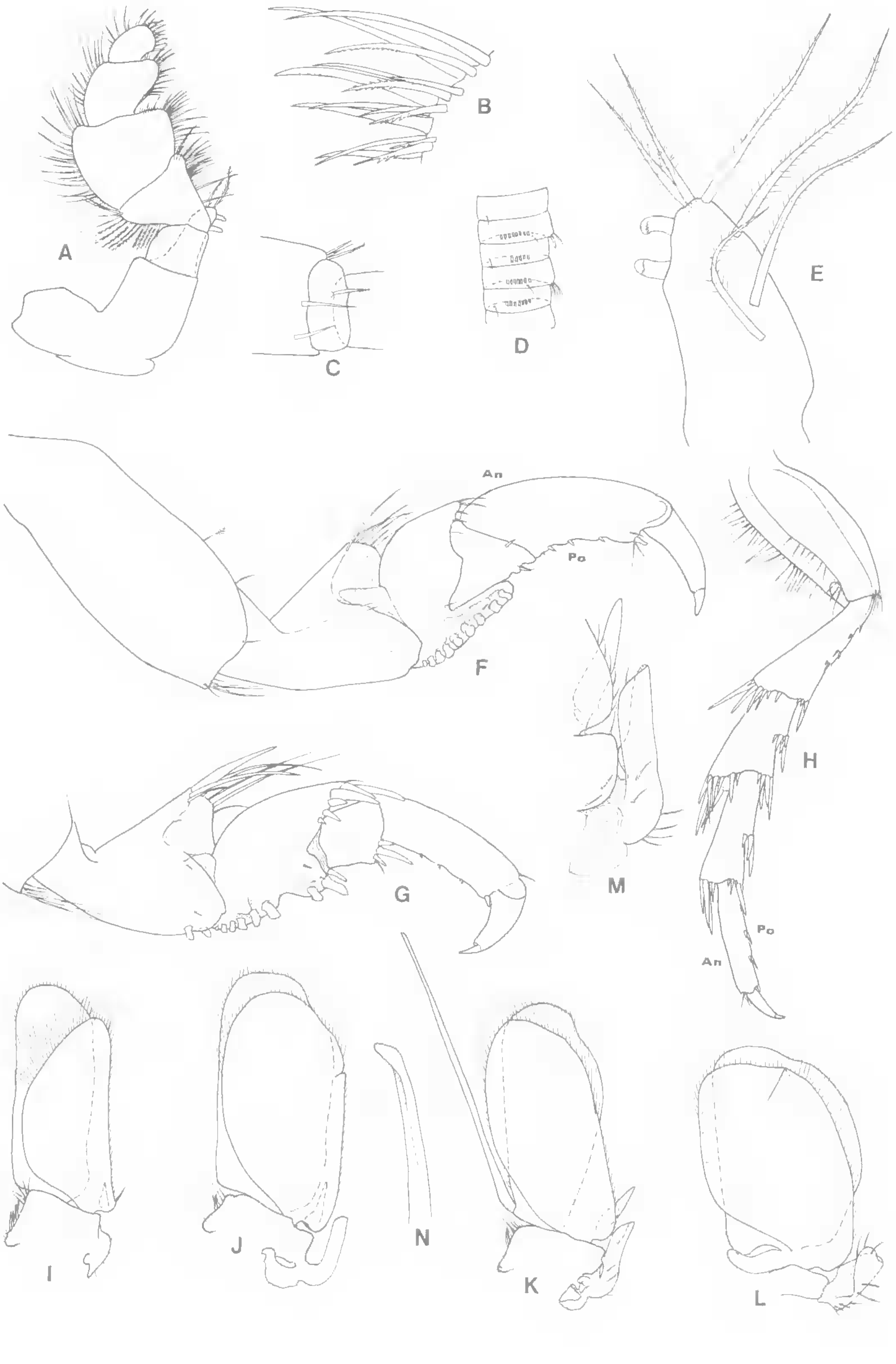
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acter, but is none the less clearly expressed by those genera that show it.

The genus *Cirolana* has no species with medially indented cephalon, flattened rectilinear penes, lobate pleopod peduncles or large epimera on pleonite 3. Additionally *Cirolana* species all have a prominent secondary unguis on the pereopod dactylus and more plumose marginal setae on the endopods of pleopods 3 and 4.

OTHER SPECIES

Aatolana schioedtei (Miers, 1884) comb.nov. Tropical Australia, from Rottnest Island, Western Australia to Hayman Island (Bruce, 1986a).

AFFINITIES

Aatolana is similar only to *Booralana* Bruce, 1986. Both genera share similar- shaped pleopod rami, have similar elongate eyes, prominent flattened penes, medially indented cephalon and prominent epimera on pleonite 3. The frontal lamina structure of the two genera differ, and in *Booralana* pleonite 2 has well developed epimera, pleonites 2 and 3 both having a ventral flange. Additionally in *Booralana* the pleotelson and uropods are without spines.

KEY TO THE SPECIES OF *AATOLANA*

1. Pleonite 4 posterolateral margin rounded;
uropod endopod lateral margin straight;
pleotelson dorsal surface never setose
. . . . *A. rapax*
Pleonite 4 posterolateral margin acute; uropod
endopod lateral margin sinuate; pleotelson
dorsal surface of large males setose
. . . . *A. schioedtei*

Aatolana rapax sp.nov.
(Figs 1-3)

MATERIAL EXAMINED

HOLOTYPE: ♂(28.7mm), outer reef slope, 5°8.4'S, 145°49.0'E, 3 May 1989, 200-150m depth, baited trap, coll. N.L. Bruce & M. Jebb (QM W17467).

PARATYPES: 9♂♂(20.0-32.2mm, m=28.3), 4 ovig ♀♀(29-33mm, mean 30.5), 6 non ovig ♀♀(21-31mm, mean 24.7); 2 mancas (7.0, 7.7mm), subsampled from c.200 specimens, data as for holotype (QM W17468).

OTHER MATERIAL: 200 specimens, topotypic series, same station as holotype, (QM W17471, NMV J27477, San Diego Natural History Museum). 4♂♂, 38♀♀, as for holotype, but 28 Apr 1989, 450m (QM W17469). 200+ specimens, as for holotype, but 29 Apr 1989, 300m (QM W17470). 93 specimens (mostly immature) outer barrier reef, between Rasch Pass and Wongat Is., 5°8.7'S, 145°49.7'E, 26-27 Jan 1990, 240m depth, coll. J.K. Lowry, J. Mizeu, J.D. Thomas (AM P40160).

DESCRIPTION

Body about 2.6 times as long as wide; pereonite 1>2=3<4=5<6>7. Pleonite 1 largely concealed by pereonite 7, epimera of pleonite 3 with posterior margin acute, with 3 longitudinal carina, medial one of which is provided with long setae; posterior margins of pleonite 4 epimera rounded, with very weak longitudinal carina. Pleotelson with lateral margins convex, converging to acute apex either side of which are 6 stout spines set amongst single row of PMS; spines restricted to distal third of pleotelson; proximal half (0.48) of lateral margin without PMS.

Cephalon with anterior submarginal furrow, dorsal interocular furrow running along top of eyes, but not extending beyond eyes. Antennule peduncle article 1 longest, 2 shortest; 4th short terminal article present; flagellum composed of about 32 articles, 1.5 times as long as peduncle, extending to anterior of pereonite 1. Antenna flagellum with about 60 articles, extending to anterior of pereonite 6. Frontal lamina as for genus. Mandible spine row with 19 spines; molar process with 27 spines interspersed with stout serrate setae; palp article 2 longest, with dense setose fringe on outer distal margin; article 3 lateral margin with continuous setae. Maxilla with 10 and 13 setae on lateral and middle lobes respectively; medial lobe with 1 large and 4 smaller circumplumose setae; anterior to these are two ranks of setae, posterior rank of 13 simple setae, anterior rank of 8, distal 5 of which are long. Maxilliped palp with simple setae on lateral margins of articles 3-5, PMS on article 2; articles 2-5 with about 15, 35, 20 and 11 lateral setae respectively; medial margins of articles 2-5 with about 19, 20, 12 and 12 setae respectively; article 5 with some serrate setae; endite with 6 long plumose setae.

FIG. 2. *Aatolana rapax* sp.nov. All figs of ♂ paratype 32.2mm, except N. A, maxilliped; B, distal margin, maxilliped palp article 5; C, distal margin, antennule peduncle; D, antennal flagellum, articles 23-27; E, maxilliped endite; F, pereopod 1; G, pereopod 2; H, pereopod 7; I-L, pleopods 1,3,2,5 respectively; M, pleopod 2 peduncle lateral margin; N, apex of appendix masculina, ♂ 31.5mm (An = anterior margin, Po = posterior margin).

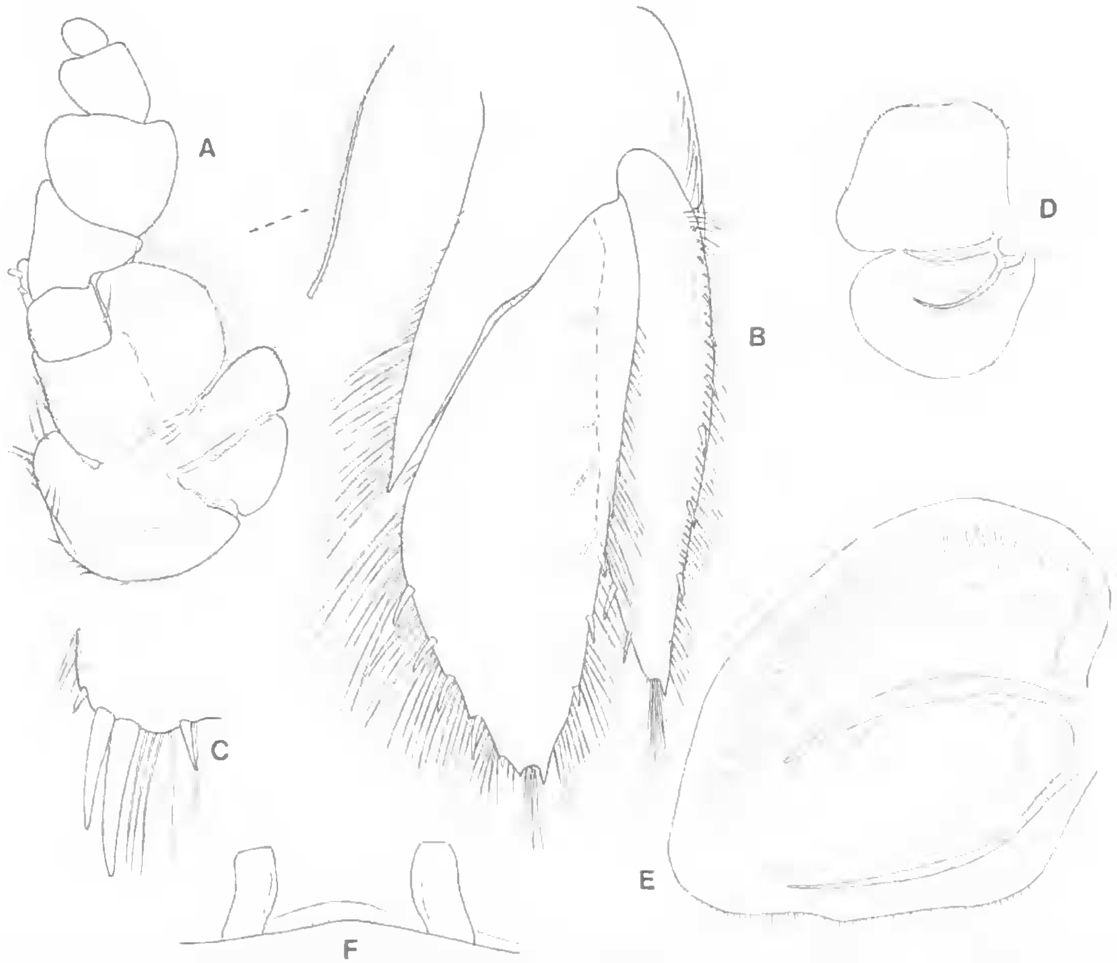
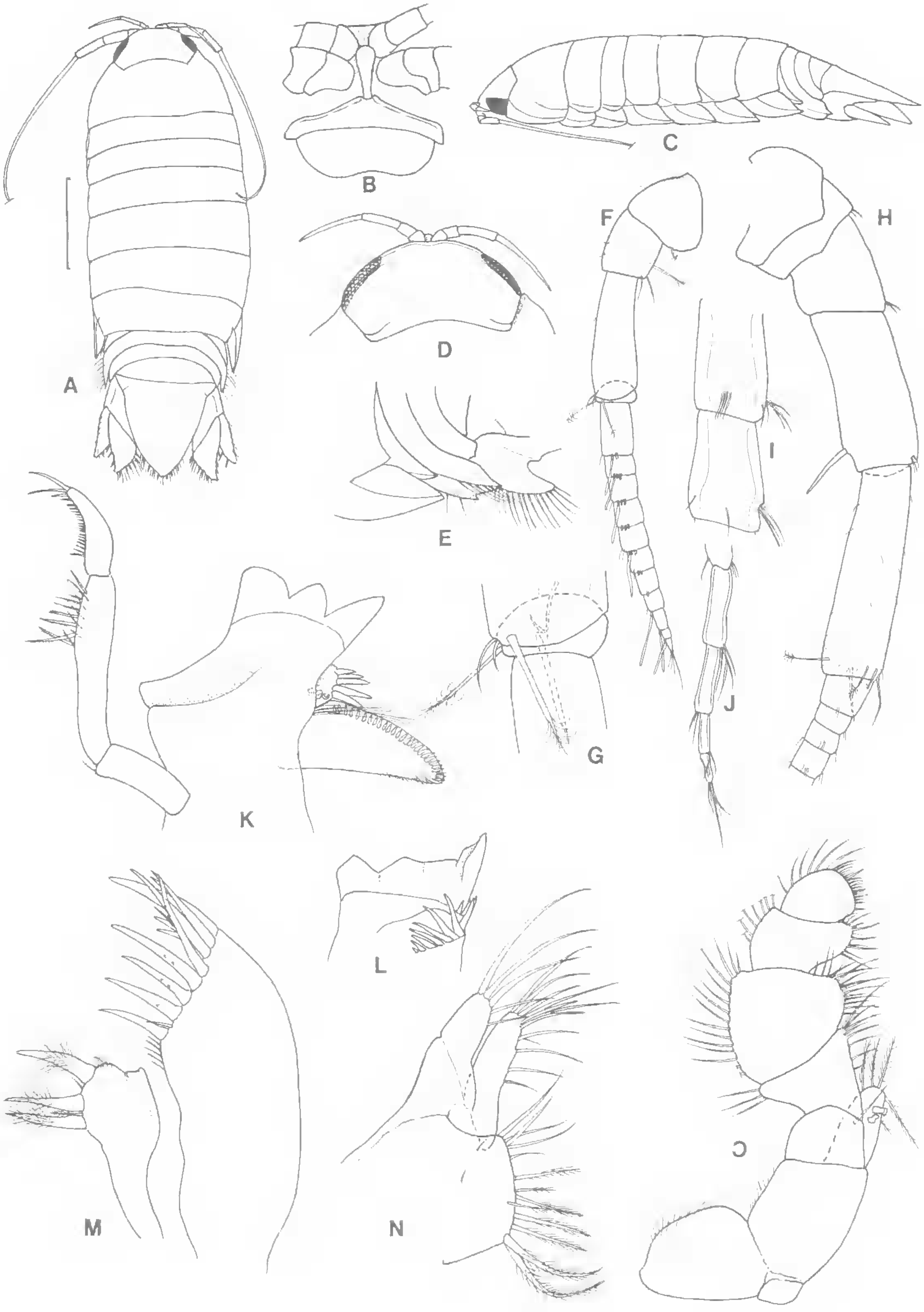


FIG. 3. *Aatolana rapax* sp.nov. A, D, E, ovig. ♀ paratype 29.4mm. A, maxilliped, showing lobes; D, oostegite 1; E, oostegite 5; B, uropod, ♂ paratype 32.2mm; C, ventrolateral angle, uropod peduncle, ♂ 32.2mm; F, penes, *in situ*, holotype.

Pereopod 1 basis with 5 setae at posterodistal angle; ischium with 6 setae at anterodistal angle; merus with 9 tubercular spines on posterior margin, 5 short simple setae at anterodistal angle; carpus with single spine on posterior margin; propodus with 3 spines on palm, 4th larger spine opposite base of dactylus. Pereopod 2 longer than 1; ischium with 6 long spines anterodistal angle, 2 robust spines posterodistal angle; merus with indented posterior margin, proximal portion with 6 stout spines, anterior portion with 2 large stout and 1 acute spine and 6 stout spines at anterodistal angle; carpus with 4 spines at anterodistal angle; propodus with 3 small spines, 4 spine at anterodistal angle; propodus with 3 small spines, 4th spine opposite base of dactylus. Pereopod 7 basis with fringe of setae on anterior margin and median carina; posterior margin of ischium with 3 clusters of short setae, 4 large spines at posterodistal angle; merus and carpus with cluster of spines on posterior margin and posterodistal angle; ischium-carpus with clusters of spines at anterodistal angles only; propodus with 3 pairs of spines on posterior margin.

FIG. 4. *Plakolana accola* sp.nov. A-E, holotype, ♂ remainder paratype 9.3mm. A, dorsal view; B, frons; C, lateral view; D, cephalon; E, pleonites, lateral view; F, antennule; G, distal margin, antennule peduncle; H, antennal peduncle; I, antenna, flagellum articles 9 and 10; J, antenna, flagellum terminal articles; K, right mandible; L, left mandible, incisor and spine row; M, maxillule; N, maxilla, O, maxilliped. Scale represents 2.0mm.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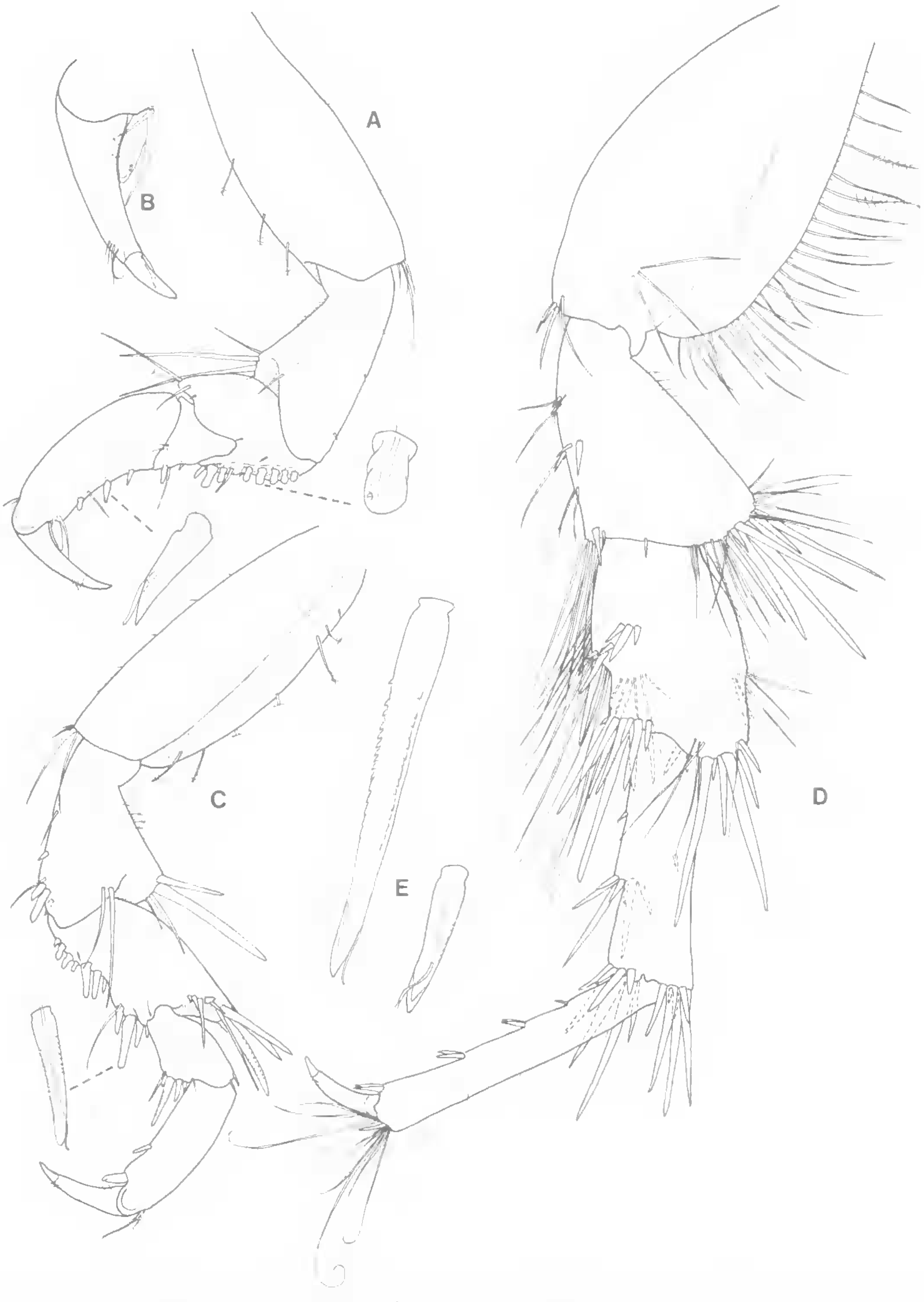


FIG. 5. *Plakolana accola* sp.nov. All figs of ♂ paratype 9.3mm. A, pereopod 1; B, dactylus, pereopod 1; C, pereopod 2; D, pereopod 7; E, spines from posterodistal angle of merus.

Pleopods as for genus. Appendix masculina with apex bent medially. Uropod exopod distinctly shorter than endopod, apex sub-bifid, lateral process prominent; lateral margin with 8-10 spines, medial with 5 spines set amongst PMS. Endopod lateral margin straight, with 5 spines, PMS for about 0.75 distal margin; medial margin with 5 spines set amongst PMS; apex sub-bifid, small spine set medially to apex.

Female. Similar to male but for: maxilliped with lamina vibrans (3 plates); pleopod endopod lobes slightly larger. Oostegites on coxae 1-5, largely overlapping; embryos retained with single large cavity formed by indentation of ventral body surface in body. Female of 29mm contained 28 ova, measuring 2.5-2.8mm in diameter.

Colour. Pale tan with abundant small reddish brown chromatophores giving a rusted appearance in life; eyes black.

Size. Males 19-32mm, non-ovigerous females 21-31mm, ovigerous females (4 specimens measured) 29-32mm. Two mancas, with pereopod 7 not present, measured 7.0 and 7.7mm.

Variation. Males, females and mancas present uniform appearance, but many specimens had malformed uropods and pleotelson. The spine counts presented here are based on 20 specimens, but damaged specimens have been omitted. Telson (n=17) with 6 + 6 spines (41.2%), 6 + 7 spines (29.4%) or 7 + 7 (29.4%). Exopod (n=38) lateral margin with 9 (47.4%), 8 (21.1%) or 10 (15.8%) spines; medial with 5 (94.7%) spines. Endopod (n=36) lateral margin with 5 (44.4%), 6 (41.7%) or 7 (5.6%) spines; medial margin with 5 (11.0%), 6 (63.9%) or 7 (27.8%) spines.

REMARKS

This species is readily identified and distinguished from *A. schioedtei* by the pleotelson spines being restricted to the posterior third of the pleotelson, uropod lateral margins being straight not sinuate, posterior margin of pleonite 4 being rounded not acute and in lacking an entire dorsal interocular furrow. *Aatolana rapax* never has the dorsal surface of the pleotelson setose, which occurs in large males of *A. schioedtei*.

Plakolana gen.nov.

Body smooth, unornamented. Cephalon anterior margin medially indented, without rostral point. Pereonite 1 about twice as long as 2; pleonite 1 partly or wholly concealed by pereonite 7. Pleonite 3 with epimera prominent, with postero ventral incision; longitudinal carina with row of setae; extends posterior to pleonites 4 and 5. Telson with prominent spines and PMS.

Antennule peduncle articles 1 and 2 subequal in length, article 3 slightly longer than combined lengths of articles 1 and 2. Antenna with articles 1-3 short, 4 and 5 long, with article 5 longest. Frontal lamina slender, elongate, about 5 times longer than basal width. Mandibles with prominent spine row and molar process. Maxillule lateral lobe with stout spines on gnathal surface, medial lobe with 3 stout circumplumose spines. Maxilla with all lobes well developed. Maxilliped palp articles 2-5 with both margins setose; endite with 2 coupling hooks and prominent plumose setae.

Pereopods 1-3 with long spines at anterodistal angles of ischium and merus; pereopods 4-7 with ischium, merus and carpus, expanded, markedly flattened, abundantly provided with long spines, and long simple setae on anterior margin of basis, and posterior margins ischium and merus. All pereopods with slender secondary unguis on dactylus. Penes opening flush (or nearly so) to ventral surface of sternite 7.

Pleopod 1 peduncle quadrate, slightly longer (1.2) than wide; pleopod 2 appendix masculina attached basally. PMS present on all rami except the endopod of pleopod 5. Uropod peduncle with prominent row of simple setae along lateral margin.

Female: Maxilliped with lamina vibrans, in ovigerous specimens. Brood pouch composed of oostegites arising from coxae 1–5.

TYPE SPECIES

Plakolana accola sp.nov., here designated.

ETYMOLOGY

From the Greek *Plakos* ('anything flat and wide') combined with *-lana*. Gender is feminine.

REMARKS

The genus is characterized by having flattened and densely spined and setose posterior pereopods, slender secondary unguis on the dactylus, the unique shape of pleonite 3 (with an a cute posterior point and ventrolateral incision), the elongate frontal lamina and the quadrate peduncle of pleopod 1. The flattened basis pereopaods 4-7 with a row of simple setae along the anterior margin, is the only character that can be recognized as a potential unique apomorphy. Nonetheless the combination of characters delimits the genus.

Species of *Cirolana* never have flattened posterior pereopods, nor pereopods with abundant setae or elongate spines, and the peduncle of pleopod 1 is about twice as wide as long; in

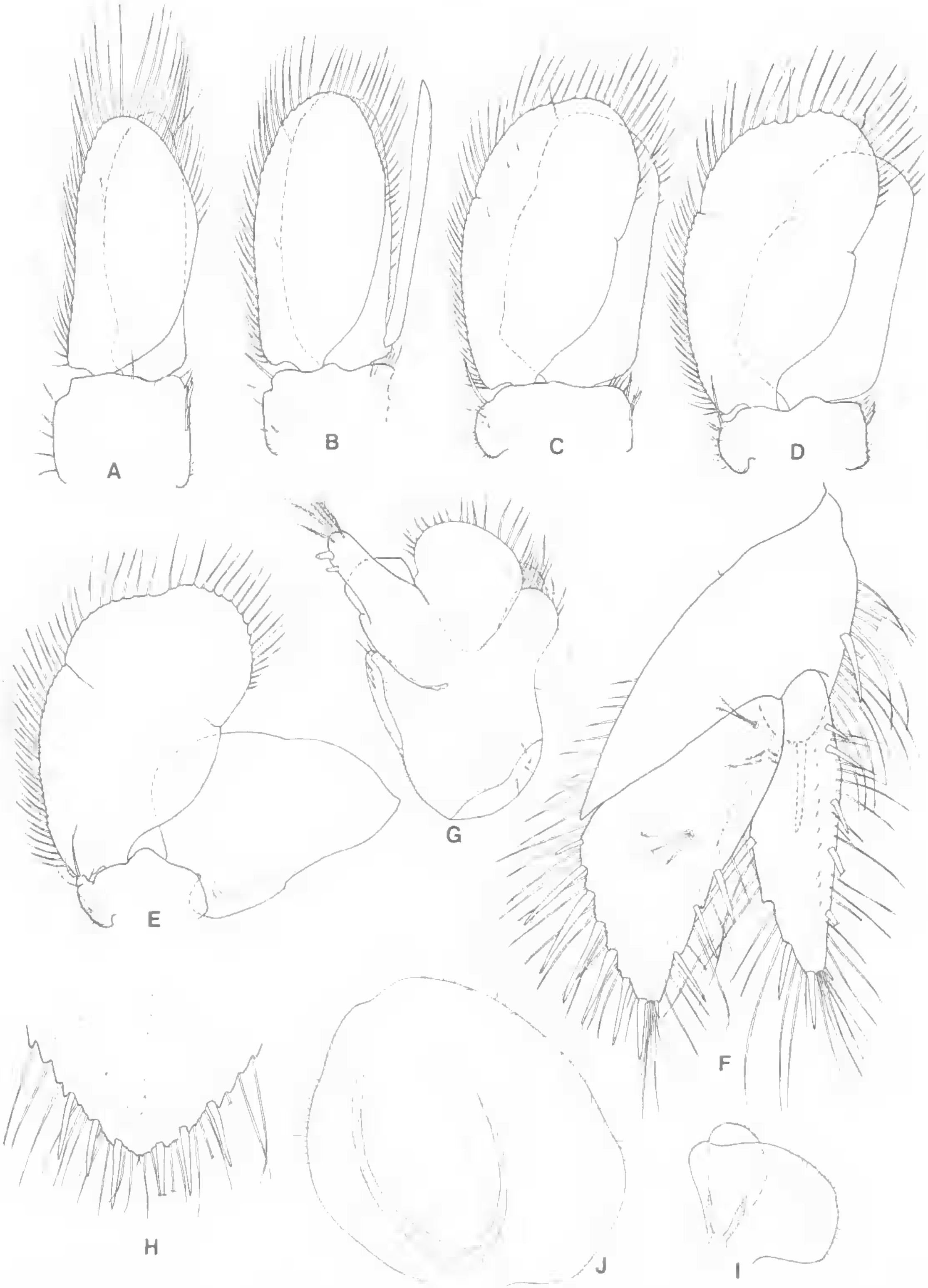


FIG. 6. *Plakolana accola* sp.nov. G, I, J, ♀paratype 10.5mm, remainder ♂ paratype 9.3mm. A-E, pleopods 1-5 respectively; F, uropod; G, maxilliped, showing lobes; H, pleotelson apex; I, oostegite 1; J, oostegite 5.

Cirolana the cephalon has a rostral point or smoothly rounded, but never medially indented. Those species that do show some of these character (see below) are in need of redescription and their generic placement reassessed.

DISTRIBUTION

The genus is currently known from the western South Pacific.

OTHER SPECIES

Plakolana binyana (Bruce, 1991). comb.nov. Southeastern Australia.

Plakolana nagada sp.nov. Madang, Papua New Guinea.

Plakolana sp. (as *Cirolana* sp. Bruce, 1986). Eastern Australia. Known from a single immature specimen.

It is possible that *Cirolana bougartii* Kensley, 1984 belongs in *Plakolana* because the morphology of the antennule, frontal lamina, pereopods and pleopods all agree with the generic diagnosis. Characters that differ include the anterior margin of the cephalon being apparently smoothly rounded (possibly due to the perspective of the figure), pleonite 1 is largely visible, and the pleotelson and uropods are not described as having spines. This species needs further examination to assess its correct generic placement. Similarly *Cirolana stebbingi* Nierstrasz, 1931 shows a similar pleon, antennule, pereopod and pleopod morphology, and also needs to be described in detail before it can be assigned to the correct genus.

AFFINITIES

The pereopod morphology, smooth body surface, elongate pleopod 1 peduncle, and frontal lamina shape suggest that this genus is closest to *Politolana* Bruce, 1981. *Politolana* however differs in having the anterodistal margin of the ischium and merus of pereopod 1 strongly produced, in having the basis anterior margin without setae and furthermore lacks the long spines of *Plakolana*. The appendix masculina is sword shaped and sub-basally attached. In *Politolana* the antennal morphology, with peduncle articles 1 and 2 short, 3-5 long, is more similar to that of *Natatolana* than to *Plakolana* which has antennal peduncle articles 1-3 short, 4 and 5 long.

KEY TO THE SPECIES OF *PLAKOLANA*

1. Frontal lamina widest anteriorly; uropod endopod spines long (15-35% length of endopod); uropod endopod distally narrowed, medial margin approximately straight 2
   Frontal lamina with straight lateral margins; uropod endopod spines short (less than 12% length of endopod); uropod endopod distally wide, medial margin sinuate.......... 3
2. Antenna flagellum extending to pereonite 4 or 5; uropod endopod medial margin with 7 spines, distalmost spine about equal in length to adjacent spine.......... *P. accola*
   Antenna flagellum extending to pereonite 2 or 3; uropod endopod medial margin with 5 spines, distal most of which is twice as long as adjacent spine .... *P. nagada*
3. Cephalon with complete dorsal interocular furrow; frontal lamina anteriorly rounded; pleotelson with 7* spines...... *Plakolana* sp.
   Cephalon dorsal interocular furrow incomplete; frontal lamina distally acute; pleotelson with 4 spines .... *P. binyana*

*Plakolana sp. was described from a juvenile (Bruce, 1986: 143, fig. 96). In cirolanids pleotelson spines are nearly always paired, in which case the 'normal' spination for this species would be 6 or 8.

Plakolana accola sp.nov.

(Figs 4-6)

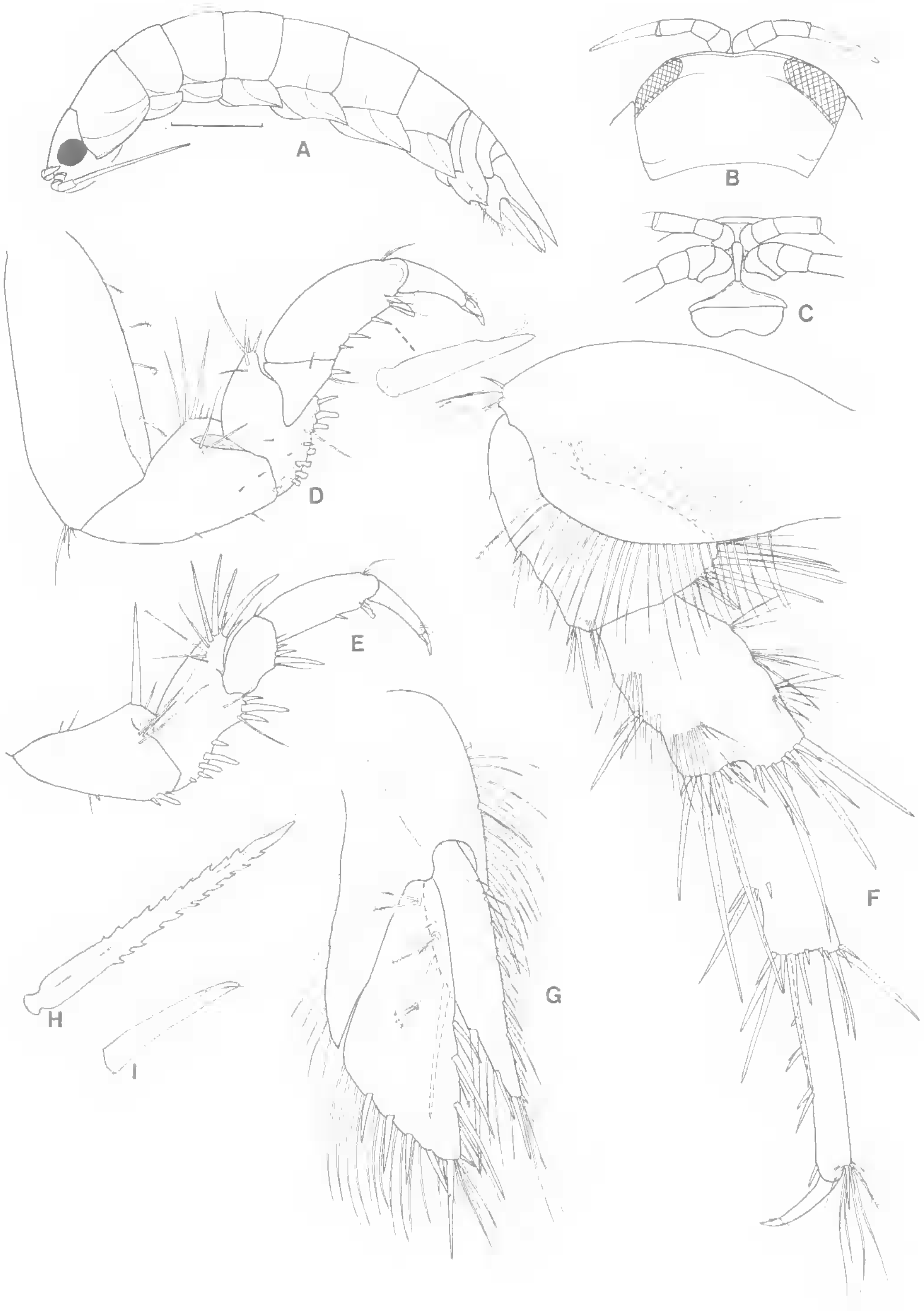
MATERIAL EXAMINED

HOLOTYPE: ♂ (9.5mm), off outer reef slope, south of Wongat Is., 5°08.4'S, 145°51.0'E, 29 Apr 1989, 300m depth, coll. N.L. Bruce & M. Jebb (QM W17993).

PARATYPES: 4♂♂ (9.3 dissected, 9.0, 7.8, 7.0mm), 9♀♀(10.5mm ovig, 10.5, 8.0, 8.0, 7.5, 7.0, 6.5, 6.5, 6.0mm), 3 imm (5.5, 5.0, 5.0mm), same data as holotype (QM W 17994-17996). 2♂♂(7.5, 6.8mm), ♀(7.0 non-ovig), as for holotype but 29 Apr 1989, 450m depth (NMV J27475). 9♂♂, 5♀♀, 8 mancas, off outer reef slope between Rasch Pass and Wongat Is, 5°8.7'S, 145°49.7'E, 26-27 Jan 1990; 440m depth, coll J.K. Lowry, J. Mizeu, and J.D. Thomas (AM P40161; 1♂, 1♀ San Diego Museum).

DESCRIPTION

Body about 2.7 times as long as wide. Cephalon with anterior submarginal furrow, dorsal interocular furrow absent. Pereonite 1>2=3<4<5=6>7. Coxae of only pereonites 7 clearly visible in dorsal view. Pleon short, ca. 10% of BL, all of pleonite 1 and most of pleonite 2 concealed by pereonite 7. Pleotelson about as long as wide, lateral margin convex, converging smoothly to subacute apex; posterior margin with 6 acute spines and PMS.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Antennule peduncle article 3 longer than lengths of article 1 and 2 combined; flagellum composed of 11 articles, article 1 longest, and extending to anterior of pereonite 1. Antenna with flagellum of 32 articles, extending to anterior of pereonite 5. Frontal lamina anteriorly widest, with anterior margin rounded; about 2.5 times as long as maximum width. Mandibles with 8 (right) or 11 (left) spines on spine row, molar process with about 28 teeth; palp article 2 with about 11 simple and 4 serrate spines; article 3 with 20 spines. Maxilla with 11 spines on gnathal surface setae on lateral and middle lobes respectively; medial lobe with 7 plumose setae (proximal) and 5 simple seta. Maxilliped with simple setae on lateral shorter, those of article 5 serrate and simple; endite with 5 long circumplumose setae.

Pereopod 1 with 4 setae at posterodistal angle of basis; 3 terminally plumose setae on anterodistal margin, ischium posterior margin with 2 small spines, anterodistal angle with 3 long setae; merus with 7 blunt tubercular spines and 2 acute spines on posterior margin, anterodistal angle with 3 setae, carpus posterior margin with 2 spines and single seta, propodus with 3 spines on palm, 4th large spine opposing base of dactylus; dactylus without distinct secondary unguis. Pereopod 2 with long spines at anterodistal angles of ischium and merus; ischium posterior margin with 2 setae and 1 acute spine, distally with 2 blunt spines; merus posterior margin with 1 long seta and 1 stout spine; carpus with 4 spines, 1 long, and 2 setae, propodus with 1 spine on palm, 1 opposing dactylus. Pereopod 7 basis with margins convex, posterior margin with about 28 feebly PMS; ischium carpus with large clusters of long spines and simple setae at distal margins; posterior margin ischium and merus with 2 and 1 cluster of spines, merus with long setae; propodus with 3 groups of paired spines and a single spine proximally; anterodistal angle with long setae.

Pleopod 3-5 exopods with partial suture only. Uropod peduncle with prominent row of setae on lateral margin; with single lateral spine and 2 spines at distoventral angle: exopod lateral margin with 5 prominent and 1 small subapical spine, medial margin with 4 spines, distal spine not much larger than adjacent spine; endopod lateral margin weakly sinuate, with 3 prominent spines, longest 18% length of lateral margin, and 1 small subapical spine, medial margin with 7 spines, distal spine not much larger than adjacent spine. All margins with PMS, except proximal half (0.45) of endopod lateral margin without setae.

Female: Similar to male; oostegites on coxae 1-5; maxilliped with lamina vibrans (3 plates). Females with embryos not observed.

Colour. White to translucent in life and alcohol; chromatophores absent. Eyes pale, reddish brown to yellow.

Size. Males 7.0 - 9.5 (mean = 8.1, *n*=7), females 6.0-10.5 (mean = 7.8, *n*=10), mancas up to 5.5mm.

Variation. Pleotelson and uropod spine counts were near constant. Exopod (*n*=23) lateral margin with 5 prominent spines (95.6%), medial margin with 4 spines (64.7%) or 5 (29.4%). Endopod (*n*=23) lateral margin with 3 prominent spines (100%), medial margin with 6 (8.7%), 7 (86.9%) or 8 (4.3%).

REMARKS

Plakolana accola can be distinguished from others of the genus by the short pleon which has segment 1 and most of 2 concealed by pereonite 7. *P. binyana* from southern Australia has the frontal lamina with a narrow anterior margin and broader uropods which have far shorter spines. *P. nagada*, which occurs in shallow water within the barrier reef system at Madang, is readily distinguished by a longer pleon, longer spines on the uropods, and by having the distalmost spine on the medial margin of each uropod ramus far longer than the adjacent spine.

DISTRIBUTION

Outer reef slope at Madang, between 300 and 450m depth.

ETYMOLOGY

Accola is a Latin word meaning neighbour.

Plakolana nagada sp nov.

(Figs 7, 8)

MATERIAL EXAMINED

HOLOTYPE: ♂ (6.9mm), east of CRI jetty, Nagada Harbour, 5°09.6'S, 145°48.7'E, 2 Feb 1990, 16m depth, soft mud bottom, coll. J.K. Lowry and J.K. Elliot (AM P41015).

PARATYPES: ♂ (7.8mm, dissected), 5♀♀ (8.0 dissected, 7.5, 7.3, 7.2, 7.2mm), imm (4.9mm), same data as holotype (AM P40172). ♀ (7.1mm, ovig), south of

FIG. 7. *Plakolana nagada* sp.nov. A-C, holotype, remainder ♂ paratype 7.8mm. A, lateral view; B, cephalon, C, frons; D, pereopod 1; E, pereopod 2; F, pereopod 7; G, uropod; H, spine, distal margin of merus; I, short spine, anterodistal angle of carpus. Scale represents = 1.0mm.

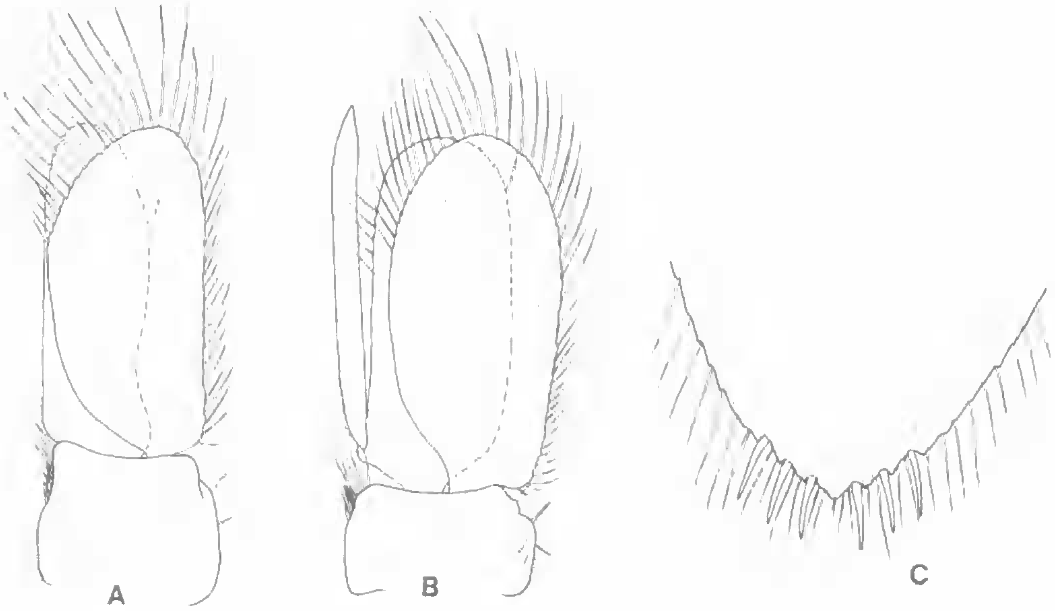

FIG. 8. *Plakolana nagada* sp.nov. All figs of ♂ paratype 7.8mm. A, pleopod 1; B, pleopod 2; C, pleotelson apex.

Tripod Reef, 5°09.7'S, 145°51.3'E, 30 Apr 1989, 22m depth, on sand, coll. N.L. Bruce (QM W18001).

DESCRIPTION

Pleon about 12.5% BL, pleonite 2 largely visible. Pleotelson with 6 spines.

Antenna flagellum extending to posterior of pereonite 3.

Pereopod 1 merus posterior margin with 6 blunt spines and 2 short acute spines. Pereopod 2 merus posterior margin with 1 long seta and 8 stout spines. Pereopod 7 merus with 3 clusters of setae on anterior margin; posterior margin with 2 ranks of simple setae.

Uropod exopod lateral margin with 5 prominent and 1 small subapical spine; medial margin with 4 spines, proximal two longest, distal spine distinctly longer than adjacent spine. Endopod lateral margin with 3 prominent and 1 small subapical spine; 2 longest spines are 32 and 35% length of lateral margin; medial margin with 5 spines, distalmost spine about twice as long as adjacent spine.

Colour. Pale brown in alcohol; eyes pale brown.

Size. Adults 6.9 - 8.0mm.

Variation. Pleotelson and uropod spine counts are near constant. Exopod lateral margin with 5 large and 1 small (100%); medial margin with 4 spines, 3 once. Endopod lateral margin 3 large spines and 1 small (86.6%) or with 2 large spines (13%); lateral margin with 5 (54.5%) or 6 (45.5%) spines (n=15 for all percentages). Pleotelson posterior margin with 6 (62.5%) or 5 (37.5%) spines (n=8).

REMARKS

Plakolana nagada is very similar to *P. accola*, but differs both in habitat (inshore, shallow sedimentary bottom compared to deeper reef slope) and numerous morphological features.

P. nagada in the first instance has much longer pereopod and uropod spines, and also has more of the pleon visible. Specifically the two species can be separated by *P. nagada* having most of pleonite 2 visible, 5 spines on endopod medial margin (vs 7), the terminal spines on the endopod and exopod medial margins being far longer than the adjacent spine, and the spines on the lateral margin of the endopod being much longer (32-35% ramus length vs 18% in *P. accola).*

DISTRIBUTION

Shallow muddy and sand bottoms within the barrier reef at Madang; recorded depths 16 and 22m.

ETYMOLOGY

The epithet is taken from the type locality, and treated as a noun in apposition.

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